BRAVERMAN, E.M. (Moskva)

New books and articles. Fiz. v shkole 22 no.3:107-110 My-Je '62. (MIRA 15:7)
(Bibliography)

BRAVERMAN, E. M. (Moskva)

New books and articles. Fiz. v shkole 22 no.4:104-106 Jl-Ag '62. (MIRA 15:10)

(Bibliography)

BRAVERMAN, E.M. (Moskva)

New books and articles. Fiz.v shkole 22 no.5:108-110 S-O '62.
(MIRA 15:12)

(Bibliography--Communist education)
(Bibliography--Science)

BRAVERMAN, E.M. (Moskva)

New books and articles. Fiz.v shkole 22 no.6:94-96 N-D '62.
(MIRA 16:2)

(Bibliography--Communist education)
(Bibliography--Science)

S/103/62/023/003/008/016
D201/D301

16.6800 (1250, 1327, 1329, 2403)

AUTHOR: Bravermann, E.M. (Moscow)

TITLE: Experiments in training a machine in visual pattern recognition

PERIODICAL: Avtomatika i telemekhanika, v. 23, no. 3, 1962, 349 - 364

TEXT: The author considers the algorithm of training a machine in visual pattern recognition; the algorithm is not based on any of the given properties of patterns studied at a given instant by the machine but on the 'compactness' hypothesis which the author considers to be true for quite a wide class of patterns. The process of training is as follows: The machine is 'shown' the pattern of e.g. letter 'A' and 'B' and at the same time it is informed by code which letter it is. The machine, after corresponding computations, stores the position of the surface dividing the regions 'A' and 'B' in the perception space. As the showing of letters proceeds, the machine begins to define more and more accurately the position of

Experiments in training a machine ...

this surface, thus being gradually trained. When, after the training period, the machine is shown a pattern and 'asked' by the given code what letter is being shown, it determines at which side of the dividing surface lies the point characterizing the shown pattern and as a consequence answers which letter is actually shown. Since some of the regions, in particular those corresponding to the boundaries of multiciplities, corresponding to the pattern, may be indexed incorrectly, such an algorithm cannot result in an absolutely correct division of the perception space. To increase the reliability of pattern recognition the method of paralleling the variants can be used. The method is as follows: Several machines are trained by means of the above algorithm simultaneously and independently of each other. Every machine draws its own dividing hyper-surface. When a new pattern has to be recognized, every machine relates it to some, not necessarily the same, pattern and the final recognition is made by the 'majority of voices' cast for a given pattern. This method has been found quite successful. In the experiment the machine was trained to recognize the pattern of numbers 0, 1, 2, 3 and 5, placed in an area 6 x 10. In all 798 numbers were drawn,

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each having standardized vertical dimensions (10 grid divisions) and all were placed approximately in the center of the field. 202 of those were used for training, the rest being used for checking its results. Using the method of paralleled variants the experimentally obtained results gave 98.5 % of correct recognitions. There are 6 tables, 11 figures and 10 references: 5 Soviet-bloc and 5 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: W.E. Busher, Electronics, July 22, 1960; IRE International Convention Record, part 2, p. 66-87, 1960; F. Rosenblatt, Proc. IRE, v. 48, no. 3, 1960; F. Rosenblatt, Symposium on the Mechanisation of Thought Processes, England, November 1958.

SUBMITTED: September 9, 1961

Card 3/3

AYZERMAN, M.A.; BRAVERMAN, E.M.; GLUSHKOV, V.M.; KOVALEVSKIY, V.A.; LETICHEVSKIY, A.A.

Theory of image recognition and self-teaching systems. Izv. AN SSSR. Tekh. kib. no.5:98-101 S-O '63. (MIRA 16:12)

BRAVERMAN, E.M. (Moskva)

New books and articles. Fiz.v shkole 23 no.1:103-106 Ja-F '63.
(MIRA 16:4)
(Bibliography--Science)
(Bibliography--Communist education)

MIKHAYLOV, A.V.; GERSHMAN, V.M.; BRAVERMAN, E.M. (Moskva)

Criticism and bibliography. Fiz. v shkole 23 no.3:104-109 My-Je '63. (MIRA 16:12)

1. Undino-Posel'skaya srednaya shkola Chitinskoy oblasti (for Mikhaylov). 2. 56-ya shkola rabochey molodezhi, Moskva (for Gershman).

RAZUMOVSKIY, V.G. (Moskva); BRAVERMAN, É.M. (Moskva); POPOV, I.V. (Orel)

Brief news. Fiz. v shkole 23 no.3:110-112 My-Je '63.
(MIRA 16:12)

FILATOV, I.G. (Moskva); KRYLOV, D.G.; USHAKOV, M.A.; BRAVERMAN, E.M. (Moskva)

Criticism and bibliography. Fiz. v shkole 23 no.4:95-101 Jl-Ag '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni V.I. Lenina (for Ushakov).

BRAVERMAN, E.M. (Moskva); TIMCHENKO, I.N.; AVER'AYANOV, G.B. (Kirovograd)

Criticism and bibliography. Fiz. v shkole 23 no.5:104-108
S-O '63. (MIRA 17:1)

1. Gornyy tekhnikum, Prokop'yevsk (for Timchenko).

L 41844-65 EWT(d)/EPA(s)-2/TDB(JJ)/EEC(f)/BXT/T/EED-2/EWP(1) Pg-4/Pk-4/
Pq-4 IJP(c) GG/BB

ACCESSION NR AM5006612 BOOK EXPLOITATION 8/

Arkad'yev, Aleksandr Georgiyevich; Braverman, Emmanuil Markovich 48 Bx1

Teaching machines to recognize patterns (Obucheniye mashiny raspoznavaniyu obrazov) Moscow, Izd-vo "Nauka", 1964, 110 p. illus., biblio. 15,000 copies printed.

TOPIC TAGS: pattern recognition, perceptron, computer technology 16C

TABLE OF CONTENTS [abridged]:

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L 41844-65
ACCESSION NR AM5006612

SUBMITTED: 05Aug64 SUB CODE: MA, DP

NO REF SOV: 017 OTHER: 011

Card 2/2

ACCESSION NR: AP4036512 S/0103/64/025/005/0692/0695

AUTHOR: Bashkirov, O. A. (Moscow); Braverman, E. M. (Moscow); Muchnik, I. B. (Moscow)

TITLE: Algorithms for teaching recognition of visual patterns based on potential functions

SOURCE: Avtomatika i telemekhanika, v. 25, no. 5, 1964, 692-695

TOPIC TAGS: pattern recognition, visual pattern, pattern recognition theory

ABSTRACT: The algorithms are based on a hypothesis of compactness of simple visual patterns. Simple and improved potential algorithms are discussed. A standard function — potential — is connected with every point of the receptor space which appears in the teaching process; the potential is maximum at the point in question and decreases in all directions from that point; thus, the point can be considered as a "source of potential" in the receptor space. This formula for the potential describes the situation: $\varphi(R) = \frac{1}{1+\alpha R^2}$, where α is a coefficient determining the rate of decrease of potential, R is the distance between the source and

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the point in question. If the potential is generated by the points which appeared as a result of teaching and correspond to one pattern, the pattern potential will be given by:

$$\Phi_\beta(y) = \frac{1}{N^\beta} \sum_{i=1}^{N^\beta} \varphi[R(x_i^\beta, y)] \quad (\beta = 1, 2, \ldots, n),$$

where β is the pattern number, x_i^β are the points corresponding to the samples of this pattern which appeared as a result of teaching, N_β is the number of such samples, n is the number of pattern taught to the machine. In the improved algorithm, the distribution of points learned by the machine is made more uniform. Rare and close to neighbors points are given a greater weight. This increases the potentials in the areas where the density of points is low, enhancing the reliability of recognition. Results of some experiments are reported. Orig. art. has: 3 figures, 3 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 15Oct63 DATE ACQ: 03Jun64 ENCL: 00

SUB CODE: DP NO REF SOV: 001 OTHER: 000

ard 2/2

ACCESSION NR: AP4041467 S/0103/64/025/006/0917/0936

AUTHOR: Ayzerman, M. A. (Doctor of technical sciences) (Moscow); Braverman, E. M. (Moscow); Rozonoer, L. I. (Moscow)

TITLE: Theoretical basis of the method of potential functions in the problem of teaching the automata to classify input situations

SOURCE: Avtomatika i telemekhanika, v. 25, no. 6, 1964, 917-936

TOPIC TAGS: automatic control, pattern recognition, perceptron, potential function

ABSTRACT: Automata are considered which recognize the class of a situation (yes, no, analog or digital computer output, characteristics, etc.) applied to their input. The set of situations that may occur at the automaton input is limited by a selected space X and a class $\psi_{(x)}$ of functions describing the situations. Algorithms for teaching automata how to recognize the classes of input situations

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are based on a 2-variable potential function of this form:

$$K(x, y) = \sum_{i=1}^{\infty} \lambda_i^2 \varphi_i(x)\, \varphi_i(y),$$

where $\varphi_i(x)$ $(i = 1,2, \ldots)$ is a linearly independent set of functions; λ_i are real numbers which are nonzero with $i = 1, 2, \ldots, N$. Two theorems -- of the finite number of error corrections and of the convergence of the algorithm in a finite number of steps -- are proven. The "Mark-1" perceptron (J. Hay, et al., Cybernetics Collection, no. 4, 1962, translated into Russian) is treated as a particular case of a class of schemes describable by the method of potential functions. Orig. art. has: 6 figures and 29 formulas.

ASSOCIATION: none

SUBMITTED: 00	ATD PRESS: 3074	ENCL: 00
SUB CODE: MA, DP	NO REF SOV: 003	OTHER: 006

Card 2/2

L 14371-65 EWT(d)/T/EED-2/EWP(1) Po-4/Pq-4/Pg-4/Pk-4 IJP(c) BB/GG
ACCESSION NR: AP4045343 S/0103/64/025/009/1307/1323

AUTHOR: Ayzerman, M. A.; Braverman, E. M.; Rozonoer, L. I.

TITLE: Probabilistic problem on teaching automata recognition of classes by the method of potential functions

SOURCE: Avtomatika i telemekhanika, v. 25, no. 9, 1964, 1307-1323

TOPIC TAGS: pattern recognition, problem, automaton teaching, potential function method, learning automaton

ABSTRACT: The probabilistic approach to teaching automata to separate input situations into classes A and B is presented. It is assumed that the set of all situations at the input of an automaton form a space X and that probabilisties $D_a(x)$ and $D_b(x) = 1-D_a(x)$ of the point x belonging to the class A or B, respectively, are functions defined on the space X. Functions $D_a(x)$ and $D_b(x)$ are called the degree of certainty of the point x belonging to class A or B. The problem consists in determining $D_a(x)$ and $D_b(x)$ on the entire space X from the points obtained during the learning process as well as from the information to which class (A or B) they are referred.

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Under the assumption that sets A and B intersect and that $D_a(x)$ and $D_b(x)$ can be expanded in finite series in a certain system of orthonormalized functions, the algorithm for constructing the function $\Phi i(x)$ which approximates $D_a(x)$ and $D_b(x)$ is presented on the basis of the method of potential functions developed earlier by the authors (Avtomatika i telemekhanika, v. 25, no. 6, 1964). It is shown that $\Phi i(x)$ is a random function, and it is proved that when i increases it converges to $D_a(x)$. The realization of the algorithm on a general purpose digital computer is considered. Orig. art. has: 67 formulas.

ASSOCIATION: none

SUBMITTED: 13Feb64 ENCL: 00 SUB CODE: MA

NO REF SOV: 004 OTHER: 000

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L 19481-65 ESD(dp)

ACCESSION NR: AP5001762 S/0103/64/025/012/1705/1714

AUTHOR: Ayzerman, M. A.(Moscow); Braverman, E. M.(Moscow); Rozonoer, L. I.(Moscow)

TITLE: The method of potential functions in the problem of generating the characteristic of a functional converter from random observations

SOURCE: Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705-1714

TOPIC TAGS: potential function method, converter characteristic generation, functional converter, function generation algorithm

ABSTRACT: The problem of generating the unknown function

$$y = f(x_1, x_2, \ldots x_n) \qquad (1)$$

from the finite number of random inputs $x_1, \ldots x_n$ and the corresponding outputs y is analyzed. Recently, this problem turned out to be very important in connection with the synthesis of self-adjusting systems which is based on the generation of plant characteristics

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during the control process. From the mathematical point of view, this is an ordinary interpolation problem, but solving it by the ordinary methods of the theory of interpolation is difficult. The authors propose the method of potential functions developed earlier (Avtomatika i telemekhanika, v. 25, nos. 6 and 9, 1964) for the solution of this problem. Assuming that there exists an orthonormal system of functions $\phi_1(x),\ldots,\phi_k(x)$ such that function (1) can be represented by a finite series

$$f(x) = \sum_1 C_j \cdot \phi_j \cdot (x), \qquad (2)$$

and utilizing the potential function of the form

$$K(x,y) = \sum^N \phi_j(x)\ \phi_j\ (y), \qquad (3)$$

two algorithms for constructing the sequence of functions $f_i(x)$ are presented. The convergence of the sequence f_i (x) toward the

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function (1) when i → ∞ is proved. The proposed algorithms can be realized on computers. These algorithms were applied to the solution of a system of algebraic equations. This application shows that the algorithms derived here can be utilized in solving certain problems of computational mathematics. The modification of the derived algorithms for generating converter characteristics in the presence of noise is considered. Orig. art. has: 34 formulas.

ASSOCIATIONS: none

SUBMITTED: 11Apr64 ENCL: 00 SUB CODE: MA

NO REF SOV: 004 OTHER: 003 ATD PRESS: 3159

Card 3/3

AYZERMAN, M.A. (Moskva); BRAVERMAN, É.M. (Moskva); ROZONOER, L.I. (Moskva)

Robbins-Monroe process and the method of potential functions. Avtom. i telem. 26 no.11:1951-1954 N '65. (MIRA 18:12)

1. Submitted July 23, 1965.

L 13104-66 EWT(d)/T IJP(c)

ACC NR: AP6002403 SOURCE CODE: UR/0103/65/026/012/2205/2213

AUTHOR: Braverman, E. M. (Moscow)

21
B

ORG: none

TITLE: On the method of potential functions

SOURCE: Avtomatika i telemekhanika, v. 26, no. 12, 1965, 2205-2213

TOPIC TAGS: potential functioa method, pattern recognition problem, functional generator

ABSTRACT: This article deals with the convergence of algorithms of the method of potential functions presented in three articles by M. A. Aygerman, E. M. Braverman, and L. I. Rozonoer (Avtomatika and telemekhanika, no. 6, 9, 12, 1964) under broader assumptions. It is shown that the requirement for the system of functions $\{\phi_i(x)\}$ to be orthonormal can be neglected when proving the convergence of these algorithms. By neglecting this requirement, it was possible to choose the potential function K(x, y) bounded on the set X and representable by an infinite expansion:

$$K(x, y) = \sum_{i=1}^{\infty} \varphi_i(x)\varphi_i(y), \quad \max K(x, x) \leq L, \tag{1}$$

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where the system of functions $\{\phi_i(x)\}$ in a certain sense can be a complete system of functions. Theorems establishing the convergence of the algorithms presented in the second and third articles were proved on the basis of a certain lemma concerning the convergence of random processes under the only assumptions that

$$f_i(x) = \sum_{i=1}^{\infty} c_i \varphi_i(x); \quad \sum_{i=1}^{\infty} c_i^2 < \infty; \tag{2}$$

where $f_i(x)$ is the function to be generated and c_i are unknown constants. To establish the convergence of the algorithm presented in the first article under condition (2), a theorem is proved under a simpler assumption than those used in the first article. In connection with the practical application of the method of potential functions, the author analyzes the problem of constructing a potential function. The criterion for selecting the potential function K(x, y) used in all algorithms presented in the above-mentioned three articles is established. Orig. art. has: 43 formulas. [LK]

SUB CODE: 12/ SUBM DATE: 17May65/ ORIG REF: 004/ ATD PRESS: 4182

L 04901-67 EWT(d)/EWP(1) IJP(c) GG/BB/GD

ACC NR: AT6022671 SOURCE CODE: UR/0000/66/000/000/0029/0035

AUTHOR: Braverman, E. M.; Dorofeyuk, A. A.

46
41

ORG: none

TITLE: Experiments in teaching a machine pattern recognition 16 without encouragement

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Samoobuchayushchiyesya avtomaticheskiye sistemy (Self-instructing automatic systems). Moscow, Izd-vo Nauka, 1966, 29-35

TOPIC TAGS: pattern recognition, algorithm, automatic machine teaching, automaton

ABSTRACT: Algorithms for teaching a machine to recognize patterns without encouragement are considered in this paper. Objects are presented to the machine which belong to different patterns and all that is indicated is the number of classes into which these objects are to be divided; the machine is provided with no information as to which pattern each object presented belongs. What is required is that after the "self-instruction" process the division of the objects by the machine into classes coincide with the true and factually existing breakdown. A receptor space X is considered, such that a point in this space corresponds to each object presented to the machine. For the sake of simplicity, it is further assumed that there are two classes: A

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ACC NR: AT6022671

and B. Just as in the case of teaching a machine to recognize patterns with encouragement, the purpose of the automaton in this article is to draw a surface which will divide these two sets. The solution of this problem requires the introduction of more rigid constraints on the relative location of the sets corresponding to the different patterns in the receptor space than in the problem with encouragement. Since a precise formulation of these limitations was not possible, a graphic method of representation is employed, consisting in the assumption that the point sets in the receptor space which correspond to the different images are arranged in isolated groups, rather distant one from the other. There is a comparative analysis of the results of the use of the different derived algorithms for the recognition of hand-written digits, and certain recommendations are made. Orig. art. has: 3 formulas, 3 tables, and 4 figures.

SUB CODE: 09,06 / SUBM DATE: 02Mar66/ ORIG REF: 004

Card 2/2

L 16457-66 EWT(d)/T IJP(c)
ACC NR: AP6004553 SOURCE CODE: UR/0103/66/000/001/0095/0112

AUTHOR: Braverman, E. M. (Moscow); Pyatnitskiy, Ye. S. (Moscow) 54 B

ORG: none

16,44,55

TITLE: Estimates of the rate of convergence of algorithms derived on the basis of the method of potential functions

SOURCE: Avtomatika i telemekhanika, no. 1, 1966, 95-112

TOPIC TAGS: cybernetics, pattern recognition, potential function method

ABSTRACT: It is indicated that the conditions under which the convergence of algorithms for restoring the characteristics of a functional generator or for establishing the "function of the degree of certainty" (the probability that input situations belong to class A or B) from randomly observed points presented in articles [Ayzerman, M. A., E. M. Braverman, and L. I. Rozonoer. Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705—1714 and v. 25, no. 9, 1964, 1307—1323] are proved to be not sufficient for quantitative estimates of their rate of convergence. Additional assumptions are formulated (which in the authors' opinion, only unessentially narrow this class of problems) under which quantitative estimates of

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ACC NR: AP6004553

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the rate of convergence of the four algorithms presented in the above-mentioned articles are derived. It is shown that algorithms which are convergent in probability ensure "almost certain" convergence (convergence with the probability equal to unity) and estimates of the rate of such convergence are presented. Orig. art. has: 88 formulas. [LK]

SUB CODE: 09 SUBM DATE: 26Apr65/ ORIG REF: 005/ OTH REF: 002/ ATD PRESS: 4205

Card 2/2 mc

L 20742-66 EWP(k)/EWT(d)/EWP(h)/EWP(l)/EWP(v) IJP(c)
ACC NR: AP6010283 SOURCE CODE: UR/0103/66/000/003/0088/0093

AUTHOR: Braverman, E. M. (Moscow)

ORG: none

TITLE: Generation of the differential equation describing the system on the basis of information obtained during its normal operation

SOURCE: Avtomatika i telemekhanika, no. 3, 1966, 88-93

TOPIC TAGS: automatic control, differential equation generation, linear system

ABSTRACT: The problem of generating the differential equation describing the behavior of a system on the basis of information obtained during the normal operation of the system is analyzed. It is assumed that the differential equation describing the behavior of a system can be represented in the form

$$x^{(n)}(t) = F(y(t), y'(t), \ldots, y^{(m)}(t), x(t), \ldots, x^{(n-1)}(t)), \qquad (1)$$

where y(t) is the input and x(t) is the output of the system and F is an unknown function which can be represented in the form

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$$x^{(n)} = \sum_{i=1}^{N} c_i \varphi_i(y, \ldots, y^{(m)}, x, \ldots, x^{(n-1)}), \qquad (2)$$

where φ_i is a certain known system of functions and c_i are unknown coefficients. The problem is reduced in this manner to determining the unknown coefficients c_i. When it is assumed that at discrete instants $t_1, t_2, \ldots t_k$, the values $x(t_k)$, $x'(t_k)\ldots$, $x^{(n)}(t_k)$, $y(t_k),\ldots,y^{(m)}(t_k)$ can be measured and the values of φ_i can be calculated, then, as the author shows, the problem studied here appears to be very similar to the problem of restoring the characteristics of the functional generator analyzed by M. A. Ayzerman, E. M. Braverman, and L. I. Rozonoer (Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705-1714) by the method of potential functions. As an illustration of the application of the proposed algorithms in that article to the solution of the above defined problem, the following particular problem is analyzed: to generate coefficients of the differential equation

$$y(t) = c_{n+m}y^{(m)}(t) + \ldots + c_{n+1}y'(t) + c_n x^{(n)}(t) + \ldots + c_0 x(t) \qquad (3)$$

(n and m are preassigned numbers) which describes the behavior of the linear system. A slightly modified recurrence procedure (the algorithm)

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ACC NR: AP6010283

presented in the above mentioned article is applied to determine the unknown coefficients. It is proved that this procedure is convergent. Orig. art. has: 28 formulas. [LK]

SUB CODE: 12, 13 SUBM DATE: 04Aug65/ ORIG REF: 003/ OTH REF: 001
ATD PRESS: 4224

Card 3/3

L 27896-66 EWT(d)/T IJP(c)

ACC NR: AP5027888 SOURCE CODE: UR/0103/65/026/011/1951/1954

AUTHOR: Ayzerman, M. A. (Moscow); Braverman, E. M. (Moscow); Rozonoer, L. I. (Moscow)

ORG: none

TITLE: The Robbins-Monro process and the method of potential functions

SOURCE: Avtomatika i telemekhanika, v. 26, no. 11, 1965, 1951-1954

TOPIC TAGS: Robbins Monro process, potential functions method

ABSTRACT: Ya. Z. Tsypkin has shown (Avtomatika i telemekhanika, v. 26, no. 11, 1965, 1951-1954) that two of three algorithms for determining the characteristics of the functional generator on the basis of a finite number of randomly observed values presented by the authors of this article (Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705-1714) can be obtained by the Robbins-Monro method (the method of stochastic approximations). In the article, the authors analyze the interconnection between the method of potential functions and the Robbins-Monro process. They agree that, apparently, all problems to whose solution the method of potential functions has been applied can be reduced to the solution of a system of equations. However, this fact, in general, does not indicate that the Robbins-Monro process is applicable, or if applicable, that it is expedient. The following two statements are formulated: 1) Even in those cases when the problem can be reduced to the solution of a system of equations, the algorithms of the method of potential functions often can not be reduced to the

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ACC NR: AP5027888 O

Robbins-Monro process; in addition, in many cases, these algorithms provide a more effective procedure (in the sense of the rate of convergence) for solving the system of equations. 2) Even in those cases when the Robbins-Monro process can be formally applied to the solution of the problem, the convergence of this procedure can constitute another, independent problem. A detailed substantiation of these statements is presented. Orig. art. has: 8 formulas. [LK]

SUB CODE: MA/ SUBM DATE: 23Jul65/ ORIG REF: 005/ OTH REF: 004/ ATD PRESS: 4133

Card 2/2 CC

L 07827-67 EWT(d)/EWP(1) IJP(c) BB/GG

ACC NR: AP6034046 SOURCE CODE: UR/0103/66/000/010/0100/0121

AUTHOR: Braverman, E. M. (Moscow) 40 B

ORG: none

TITLE: The method of potential functions in the problem of nonsupervised teaching automata to recognize patterns 16

SOURCE: Avtomatika i telemekhanika, no. 10, 1966, 100-121

TOPIC TAGS: adaptive system, pattern recognition, ~~automation~~ machine teaching, potential function method

ABSTRACT: The problem of nonsupervised teaching automata to recognize patterns is formulated as a variational problem. It is pointed out that this problem consists in constructing a surface $f(x) = 0$ which separates the space X into two sets A and B for which $f(x) > 0$ and $f(x) < 0$, respectively, on the basis of observations of the sequence of points $x^1, x^2, \ldots, x^n$ whose probability density $P(x)$ of appearance is not given in advance and under the assumption that there is no information to which set each of these points belongs. That separating surface is sought which minimizes the performance functional

$$R(f(x)) = P_A M\{\rho^2(x, y) / x, y \in A\} + P_B M\{\rho^2(x, y) / x, y \in B\}, \quad (1)$$

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where $M\{S^2(x, y)/x, y \in A\}$ and $M\{S^2(x, y)/x, y \in B\}$ are squares of the mean distance between the points belonging to A and B, respectively, and P_A and P_B are probabilities of the points appearing from A or from B. A theorem is formulated and proved establishing the class of functions in which the separating function f(x) minimizing functional (4) is to be sought. The recurrence procedure based on the method of potential functions developed by M. A. Ayzerman, E. M. Braverman, and L. I. Rosenoer (Avtomatika i telemekhanika, v. 25, no. 6, no. 9, no. 12, 1964) is proposed for determining the separating function f(x). The realization of this procedure in the original space (machine realization) and in the rectifying space (perceptron realization) are considered. It is pointed out that the algorithm described here is similar to the Robbins-Monro procedure of stochastic approximations; however, its convergence does not follow from the theorems of that procedure. The convergence of the derived algorithm to the solution of the formulated variational problem is proved. Orig. art. has: 106 formulas.

SUB CODE: 05/ SUBM DATE: 05Apr66/ ORIG REF: 007/ OTH REF: 003/
ATD PRESS: 5101

ACC NR: AT6022668 SOURCE CODE: UR/0000/66/000/000/0003/0008

AUTHOR: Ayzerman, M. A.; Braverman, E. M.; Rozonoer, L. I. (Doctor of technical sciences)

ORG: none

TITLE: The problem of teaching machines to recognize external situations

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Samoobuchayushchiyesya avtomaticheskiye sistemy (Self-instructing automatic systems). Moscow, Izd-vo Nauka, 1966, 3-8

TOPIC TAGS: intelligent machine, pattern recognition, character recognition, artificial intelligence, perceptron, teaching machine

ABSTRACT: A method for machine recognition of external stimulae, based on so-called *potential functions*, is proposed in this paper dealing with artificial intelligence. Individuals can recognize events and patterns, and teach others to do so, frequently without being able to explain *how* the process of recognition comes about. For instance, an illiterate person can be shown letters "a" and "b" and taught to recognize these letters irrespective of their shape. This process of information transfer is therefore based not on explanation, but on demonstration. This technique can be applied to learning, pattern-recognition machines, designed to respond to audio or visual com-

Card 1/4

mands. The problem of teaching the automaton to classify correctly a given input can be defined either in the deterministic or in the probabilistic domain. In the deterministic domain, an input is classified as belonging to a certain set, hence the training process consists of supplying the machine with a set of inputs and the corresponding outputs. Consider a mathematical space of inputs X containing a finite number of points (or Euclidian with a finite number of dimensions), constructed such that each point corresponds to a defined input. Then space X contains a set of points corresponding to a set of inputs and the problem of recognizing a given input set reduces to construction of a hyperplane to separate the sets, if the boundaries of the individual point sets are unknown, but it is known that certain points belong to a given set. The hyperplane can be mathematically expressed in terms of a *separating function* existing in space X. This function assumes positive values for points belonging to one set, and negative values for points belonging to the second set. In the probabilistic domain, not the actual points in space X, but probability functions which indicate that a given point belongs to a given set, are recognized during the learning process. The automaton operating in this domain determines the probability that an input belongs to a certain set. The recognition of inputs by operating a machine in either of two domains is only possible if certain constraints are imposed on the inputs. These constraints need not be severe; for instance, a condition that the desired function not be excessively non-smooth might be necessary. The separating function for a space X is defined as

$$\psi(x) = \sum_{i=1}^{N} c_i \varphi_i(x),$$

Then a potential function can be considered, given by

$$K(x, x^*) = \sum_{i=1}^{\infty} \lambda_i^2 \varphi_i(x) \varphi_i(x^*),$$

This function is valid anywhere in space X. Assigning positive values for the region A and negative values for the region B, the general potential field can be constructed in accordance with

$$K_1(x) = \begin{cases} K(x, x^{(1)}), & \text{if} \quad x^{(1)} \in A \\ -K(x, x^{(1)}), & \text{if} \quad x^{(1)} \in B, \end{cases}$$

Theorem 1: If there exists a function (x) which strictly separates sets A and B, i.e.,

$$\psi(x) > \varepsilon, \text{ if } x \in A;$$
$$\psi(x) < -\varepsilon, \text{ if } x \in B,$$

where $\varepsilon > 0$, and which satisfies the main hypothesis, then irrespective of the nature of the point sequence from A and B, only a finite number of errors, smaller than some number m, will occur during the recognition of this sequence. *Theorem 2*: Let p be the probability of the automaton making an error after the learning phase has been completed. Assuming that the conditions of *Theorem 1* are satisfied, that the statistics of recognition are such that recognitions are independent, and that for both re-

ACC NR: AT6022668

gions A and B the probability of a point occurring in these regions is distinct from zero, then for any $\varepsilon > 0$ and $\delta > 0$, the probability that $p < \varepsilon$ is greater than $1-\delta$, if

$$N_0 > \frac{\ln \varepsilon\delta}{\ln(1-\varepsilon)}.$$

This theorem determines the convergence of the algorithm for the potential functions to the separating function in a finite number of steps with any desired accuracy. This algorithm for the potential functions is realized as a special case in the perceptron. The authors proceed to describe the application of potential functions to the probabilistic domain, and in conjunction postulate a third theorem. They conclude that it is in principal possible to apply the demonstration technique to training of automata and that a rigorously scientific, rather than an empirical, approach to the solution of this problem is possible.

SUB CODE:06,05/ SUBM DATE: 02Mar66/ ORIG REF: 001/ OTH REF: 004

Card 4/4

BRAVERMAN, E.R.

New law against trade unions and the resistance to it. Vsem.prof. dvizh. no.4:30-33 Ap '56. (MLRA 9:8)
(South Africa, Union of--Trade unions)

BRAVERMAN, I.B.

S/089/62/012/006/015/019
B102/B104

AUTHORS: Galkin, N. P., Veryatin, U. D., Karpov, V. I., Braverman, I. B., Fedoseyev, I. V.

TITLE: Thermodynamics of the reduction of uranium oxides and uranyl fluoride by certain reducing agents

PERIODICAL: Atomnaya energiya, v. 12, no. 6, 1962, 531-533

TEXT: The reduction reactions of UO_2F_2 and higher uranium oxides were calculated, and the reducibility of several reducing agents was assessed. The reaction potentials were determined for the range 373-1173°K, using the relation $\Delta Z_T = \Delta H_{298} - T\Delta S_{298} + \int_{298}^{T} \Delta c_p dT - \int_{298}^{T} \frac{\Delta c_p}{T} dT$.

The results are tabulated. UO_3 is reduced more easily than U_3O_8. ΔZ_T is greatest when NH_3 is used as reducing agent. The reducibility of CO decreases with temperature. UO_2F_2 cannot be reduced by CO, but is reduced

Card 1/2

Thermodynamics of the reduction ... S/089/62/012/006/015/019
B102/B104

by H_2 or NH_3. There are 2 figures and 2 tables.

SUBMITTED: September 11, 1961

Card 2/2

AMBAT'YELLO, G.P.; BRAVERMAN, I.B.; KISELEV, F.I.; SPIRIDONOV, Ye.Ye.

Methods and some results of the use of anesthesia for the prevention and treatment of traumatic shock under work conditions of the antishock teams of the first medical aid station of the city of Moscow. Trudy Inst. im. N.V. Sklif. 9:249-254 '63. (MIRA 18:6)

1. Stantsiya skoroy meditsinskoy pomoshchi Moskvy.

DANILOVA, B.S., kand.med.nauk; BOBROVSKIY, N.S.; BRAVERMAN, I.B.; NECHAYEV, V.A.

Use of nitrous oxide for the prevention and treatment of traumatic shock under conditions of first aid. Sov.med. 28 no.4:104-107 Ap '65. (MIRA 18:6)

1. Stantsiya skoroy pomoshchi (nachal'nik - zasluzhennyy vrach RSFSR I.B.Shapiro), Moskva.

BRAVERMAN, I. M. (KB Tsvetmetavtomatika, Moscow)

"Investigation of the Characteristics of the Three Component Regulator."

report presented at the Scientific Seminar on Pnsumo-Hydraulic Automation, 28-29 May 1957, at the Inst. for Automation and Remote Control (IAT), Acad. Sci. USSR

Avtomika I Telemekhanika, 1957, Vol. 18, No. 12, pp. 1148-1150, (author SEMIKOVA, A.I.)

BRAVERMAN, L., inzh.; PODGAYETSKIY, G., inzh.; CHUMAKOV, G., inzh.

Silos and conveyor galleries made of mesh-reinforced concrete. Prom. stroi. i inzh. soor. 5 no.2:33-38 Mr-Ap '63. (MIRA 16:4)
(Cement--Storage) (Precast concrete construction)

REPETIY, F.; BRAVERMAN, M.

Increase control over the financing of construction and capital repairs. Den. i kred. 20 no.2:79-81 F '62. (MIRA 15:2)

1. Upravlyayushchiy Berdichevskim otdeleniyem Gosbanka (for Repetiy). 2. Nachal'nik kreditnogo otdela Berdichevskogo otdeleniya Gosbanka (for Braverman).
(Berdichev--Banks and banking)
(Construction industry--Finance)

KISELEV, A.; BRAVERMAN, M.

Work practice under the new conditions. Den.i kred. 21 no.4:47-50 Ap '63. (MIRA 16:4)

1. Upravlyayushchiy Tikhvinskim otdeleniyem Gosbanka Leningradskoy oblasti (for Kiselev). 2. Nachal'nik kreditnogo otdela Berdichevskogo otdeleniya Gosbanka (for Braverman).
(Banks and banking)
(Agriculture--Auditing and inspection)

REPETIY, F.; BRAVERMAN, M.

First steps in developing public participation. Den. i kred. 21 no.7:42-44 Jl '63. (MIRA 16:8)

1. Upravlyayushchiy Berdichevskim otdeleniyem Gosbanka (for Repetiy). 2. Nachal'nik kreditnogo otdela Berdichevskogo otdeleniya Gosbanka (for Braverman).

(Berdichev--Industrial management)
(Berdichev--Auditing and inspection)

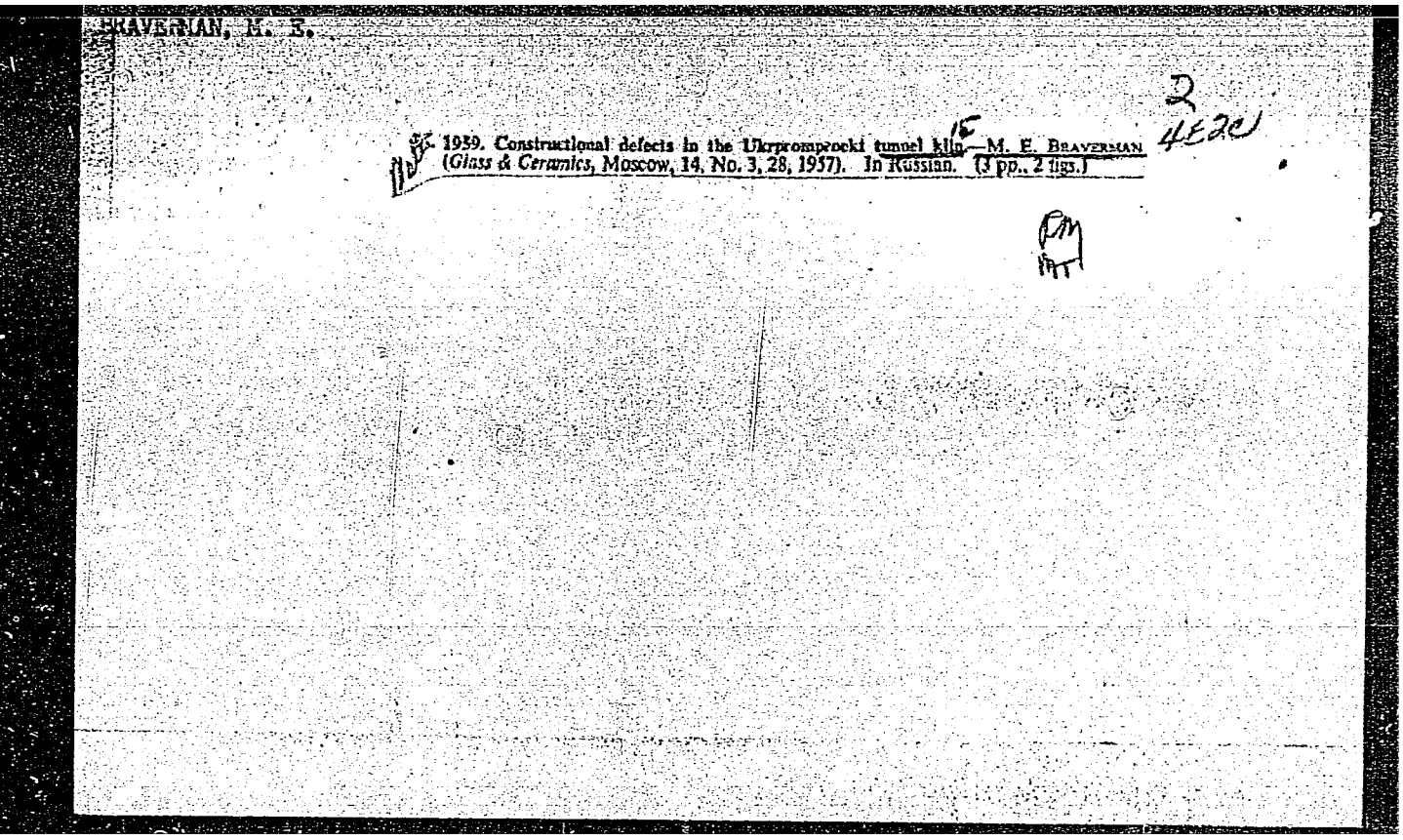
BRAVERMAN, M.E.

USSR

2636. Constructional features of a tunnel kiln.—M. E. BRAVERMAN and L. P. KACHALOVA (*Glass & Ceramics*, Moscow, 12, No. 5, 28, 1955).—Details are given of a Russian pre-war "utility" tunnel kiln. Its dimensions were: internal width, 7·2 ft.; height from car bottom to key of arch, 3·7 ft.; total length, 300 ft. (entrance chamber, 15·7 ft.; preheating-zone, c. 160 ft., firing-zone, 31·5 ft.; cooling-zone c. 87 ft.; exit chamber, 6·2 ft.). The capacity of the kiln is 60 cars each 4·9 ft. long. The kiln is fired on cold producer gas and is operated at 1,300° C. (3 figs.)

BRAVERMAN, M., inzhener.

Foamy "keralit", the lightweight insulating material. Stroi.mat.3 no.3:32 Mr '57. (MLRA 10:3)
(Insulation (Heat))



BRAVERMAN, M. E.

1939. Constructional defects in the Ukrpromprocki tunnel kiln—M. E. BRAVERMAN (*Glass & Ceramics*, Moscow, 14, No. 3, 28, 1957). In Russian. (3 pp., 2 figs.)

BRAVERMAN, M.Ye.

Acid-resistant, stiff-mud pressed bricks made of local clays.
Stek.i ker. 14 no.6:18 Je '57. (MLRA 10:7)
(Brickmaking) (Moscow Province--Clay)

BRAVERMAN, M., inzh.

Efficient method for lining tunnel cars. Stroi. mat. 4 no.11:39 N '58. (MIRA 11:12)
(Kilns)

SOROKIN, Ye.S., inzh.; GOZ, A.Z., inzh.; BRAVERMAN, M.Z., inzh.

Hard facing of track blocks with powder wire. Svar. proizv. no.9:29-30 S '64. (MIRA 17:12)

1. Bryanskiy avtomobil'nyy zavod.

SOROKIN, Ye.S., inzh.; BRAVERMAN, M.Z., inzh.

Welding the pins of a T-180 tractor with a modernized P-912 automatic machine. Svar. proizv. no.10:38-39 O '65.
(MIRA 18:10)

1. Bryanskiy avtomobil'nyy zavod.

TRAKHTENBERG, I. M.; PAUSTOVSKAYA, V. V.; BRAVERMAN, R. S. (Kiyev)

Hygienic evaluation of work conditions in the production of linoleum, polychlorvinyl and coumarone tiles. Gig. truda i prof. zab. no.1:53-55 '62. (MIRA 15:2)

1. Kiyevskiy meditsinskiy institut, sanitarno-epidemiologicheskaya stantsiya Pecherskogo rayona.

(INDUSTRIAL HYGIENE) (FLOOR COVERINGS)

BRAVERMAN, S., inzh.

Use of vegetable oil in producing drying oil. Sel'.stroi.12 no.12:26-27 D '57. (MIRA 10:12)

(Drying oils)

BRAVERMAN, S.L., inzhener.

Manufacture of hollow bricks in Moscow factories. Gor.khoz. Mosk. 24 no.2:17-20 F '50. (MLRA 7:11)
(Moscow--Hollow bricks) (Hollow bricks--Moscow)

BRAVERMAN, S.M., inzhener.

Prime coat concentrates in painting. Biul.strei.tekh. 13 no.7: 17-18 Jl '56. (MLRA 9:9)

1.TSentral'naya eksperimental'no-issledovatel'skaya laboratoriya Soyuzpetsstroy.
(Painting, Industrial)

BRAVERMAN, S.M., inzh.

Silicate mastic for facing surfaces with glazed tiles. Suggested by S.M.Braverman. Rats.i izobr.v stroi. no.9: 58-59 '59. (MIRA 13:1)

1. Rukovoditel' TSentral'noy eksperimental'skoy laboratoriyey trests Mosotdelstroy.
(Tile laying)

BRAVERMANAS, L.

Massive doses of strychnine in the treatment of barbiturate coma. Sveik. apsaug. 7 no.4(76):22-26 Ap '62.

1. Vilniaus m. IV ligonine. Vyr. gydytojas - V. Baltaitis.

(BARBITURATES toxicol) (STRYCHNINE ther)

METELICA, N.; BRAVERMANAS, L.

3 cases of polycystic kidney. Sveik. apsaug. 7 no.8:34-37 '62.

1. Vilniaus m. IV ligonine. Vyr. gydytojas — V. Baltaitis.
(KIDNEY POLYCYSTIC)

BRAVICHEV, V.A., kandidat tekhnicheskikh nauk, dotsent; BRODOVICH, N.V., kandidat tekhnicheskikh nauk; VLASOV, V.I., kandidat tekhnicheskikh nauk, retsenzent, redaktor; YEGORNOV, A.N., professor, retsenzent, redaktor; ZOBNIN, N.P., doktor tekhnicheskikh nauk, professor,; IVANNIKOV, D.G., kandidat tekhnicheskikh nauk, dotsent; KIRKIN, V.G., doktor tekhnicheskikh nauk,professor; KOTOV, O.K. kandidat tekhnicheskikh nauk; MARIYENBAKH, L.M., doktor tekhnicheskikh nauk, professor; MASHONIN, P.A., inzhener, RUBINSHTEYN, S.A., inzhener, RUDOY, M.L. inzhener, YUDIN , D.L., kandidat tekhnicheskikh nauk, dotsent, redaktor; PETROV, N.I., inzhener, retsenzent; SIDOROV, S.I., inzhener, retsenzent; SOKOLOV, I.G., kandidat tekhnicheskikh nauk, retsenzent; BERESTOVA, Ye.I., inzhener, retsenzent; DOROKHIN, P.N., kandidat tekhnicheskikh nauk, retsenzent; RUSTEM, S.L., kandidat tekhnicheskikh nauk, dotsent, redaktor; LARIN, M.N., laureat Stalinskoy premii, professor, doktor tekhnicheskikh nauk, retsenzent; SOKOLOV, A.V., inzhener, retsenzent; GRUDOV, P.P., laureat Stalinskoy premii, dotsent kandidat tekhnicheskikh nauk, retsenzent;DONNER, L.L., inzhener, retsenzent; ZOBNIN, professor, doktor tekhnicheskikh nauk, retsenzent; BELAVENTSEV, N.V., inzhener, retsenzent; SYCHEV, B.P., dotsent, retsenzent; SHKOL'NIK, L.M., kandidat tekhnicheskikh nauk, retsenzent; LOBANOV, D.V., kandidat tekhnicheskikh nauk,dotsent, retsenzent, redaktor; MASHONIN, P.A., inzhener, retsenzent, redaktor; OBUKHOV, A.F., inzhener, redaktor; BELETSKIY, D.G., kandidat tekhnicheskikh nauk, dotsent, redaktor; ODING, I.A., redaktor; LEVITSKIY, kandidat tekhnicheskikh nauk, dotsent, redaktor; YUDSON, D.M., tekhnicheskiy redaktor

(Continued on next card)

BRAVICHEV, V.A, kandidat tekhnicheskikh nauk, dotsent; & others (Card 2)

[Railroad man's technical manual] Tekhnicheskii spravochnik zheleznodorozhnika. Red.kollegiia: V.I. Vlasov. A.N.Egornov, N.P. Zobnin, E.F Rudoi (Glav.red.) A.V.Sokolov. Moskva, Gos.transportnoe zhel-dor.izd-vo. Vol. 12 [Processing metals at railroad transport enterprises] Obrabotka metallov na predrpiiatiiakh zheleznodorozhnogo transporta. Otvet.red. N.P.Zobnin. 1954. 671 p.(MLRA 8:11)

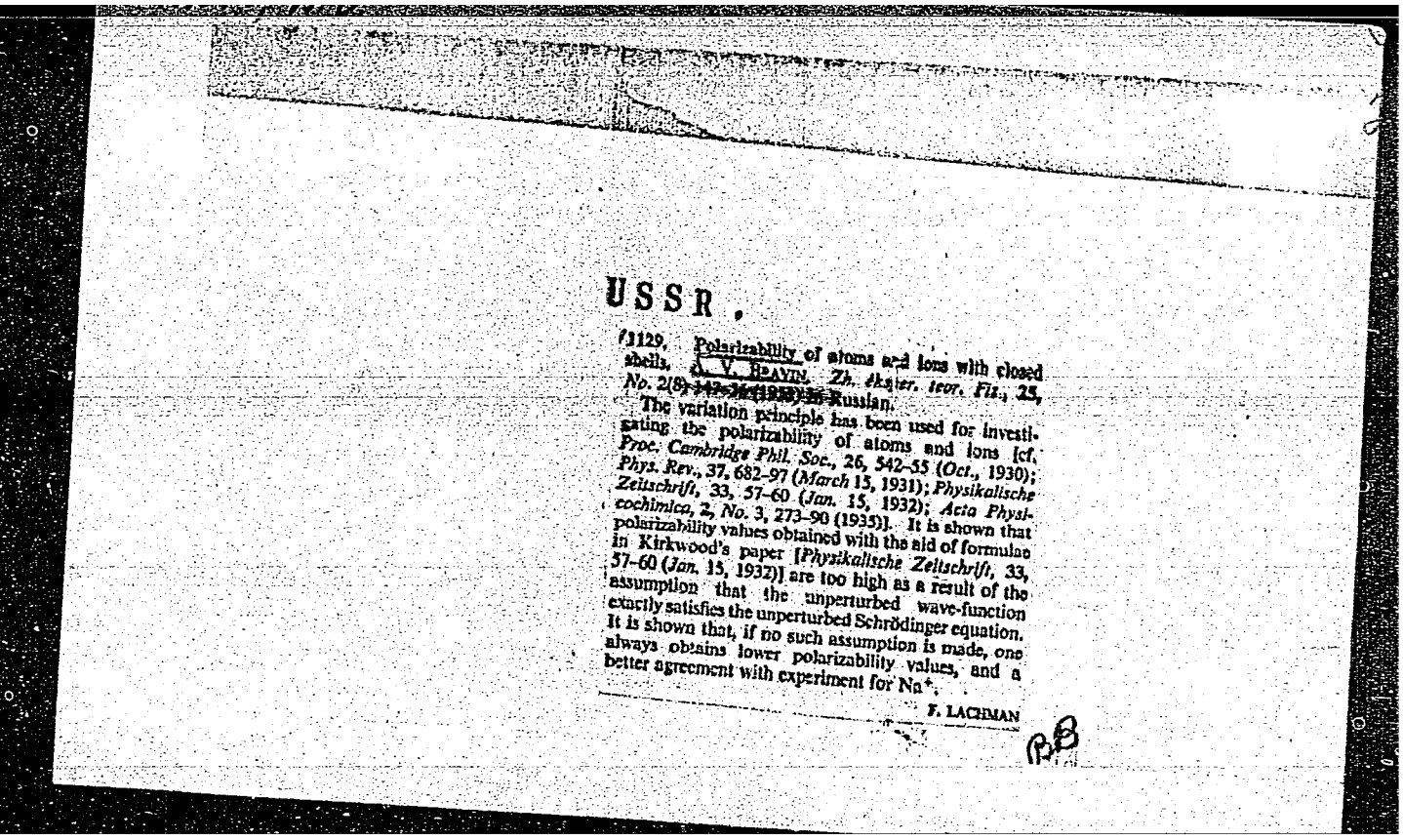
1. Chlen-korrespondent, AN SSSR (for Oding)
(Mechanical engineering)

BRAVICHEV,V.A.; GAYDAR,V.I.; ZININ,M.V.; MEUSHCHIKOV,I.I.; BRITKIN,A.S. retsenzent; ROZENBERG,Yu.A., kandidat tekhnicheskikh nauk, redaktor; TIKHONOV,A.Ya., tekhnicheskiy redaktor

[Metal cutting machines] Metallorezhushchie stanki. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 660 p.
(Metal cutting) (MLRA 9:3)

BRAVICHEV, V.A., dots., kand. tekhn. nauk; KORSAKOV, V.S., tekhn. nauk, prof., retsenzent; OKHLYAND, A.B., inzh., red.; SEMENCHENKO, V.A., red. izd-va; DEMKINA, N.F., tekhn. red.

[Hydraulic and pneumatic control devices for machine tools] Gidravlicheskie i pnevmaticheskie avtomatiziruiushchie ustroistva metallorezhushchikh stankov. Moskva, Izd-vo "Mashinostroyenie," 1964. 262 p. (MIRA 17:4)



USSR

3129. Polarizability of atoms and ions with closed shells. V. Rdavin. *Zh. eksper. teor. Fiz.*, 25, No. 2(8) 142-[illegible] (1953) In Russian.

The variation principle has been used for investigating the polarizability of atoms and ions [cf. *Proc. Cambridge Phil. Soc.*, 26, 542–55 (*Oct.*, 1930); *Phys. Rev.*, 37, 682–97 (*March* 15, 1931); *Physikalische Zeitschrift*, 33, 57–60 (*Jan.* 15, 1932); *Acta Physicochimica*, 2, *No.* 3, 273–90 (1935)]. It is shown that polarizability values obtained with the aid of formulae in Kirkwood's paper [*Physikalische Zeitschrift*, 33, 57–60 (*Jan.* 15, 1932)] are too high as a result of the assumption that the unperturbed wave-function exactly satisfies the unperturbed Schrödinger equation. It is shown that, if no such assumption is made, one always obtains lower polarizability values, and a better agreement with experiment for Na^+.

F. LACHMAN

RB

BRAVIN, A. V.

"Polarizability of Atoms and Ions With Filled Shells." Cand Phys-Math Sci, Saratov State U, Saratov, 1954. (RZhFiz, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

USSR/Nuclear Physics - Polarization

Card 1/1 : Pub. 146-16/20 FD-1493

Author : Bravin, A. V.

Title : [redacted] Computation of polarizability of certain atoms and ions (Letter to the editor)

Periodical : Zhur. eksp. i teor. fiz., 27, 384-385, Sep 1954

Abstract : Formulas derived in the author's previous work (ibid. 25, 147, (1953)) are used to compute the polarizability of negative ions of fluorine and chlorine and of positive ions of sodium and potassium and of inert gases neon and argon. Results are tabulated. Eight references including 5 foreign.

Institution : Saratov State University

Submitted : December 21, 1953

BRAVIN, A.V.; GOVYADINOVA, L.A.

Computation of the prime photoeffect for a well with a diffused edge. Izv.vys.ucheb.zav.;fiz. 2:175-176 '62. (MIRA 15:7)

1. Saratovskiy gosudarstvennyy universitet imeni N.G.Chernyshevskogo.
(Photonuclear reactions)

24.7000

39035
S/139/62/000/003/002/021
E032/E314

AUTHOR: Bravin, A.V.

TITLE: Resonance formula for photonuclear reactions

PERIODICAL: Izvestiya vysshikh uchebykh zavedeniy, Fizika, no. 3, 1962, 14 - 20

TEXT: A formula is derived for the cross-section for photonuclear reactions, using a form of perturbation theory as applied to the time-dependent Schroedinger equation. It is assumed that direct processes associated with the transition of a nucleon from the ground state to the continuous spectrum are relatively unimportant and therefore can be neglected in comparison with transitions through the compound nucleus. The formula gives an explicit dependence of the cross-section on the energy of the incident photons and can be used to calculate the absorption cross-section, the probability of emission of a nucleon and the total level width if it is assumed that the nucleon-nucleon interaction can be described by two particle forces.

Card 1/2

39035

Resonance formula S/139/62/000/003/002/021
E032/E314

ASSOCIATION: Saratovskiy gosuniversitet
(Saratov State University)

SUBMITTED: February 14, 1961

Card 2/2

BRAVIN, I., polkovnik

Preparation of a rifle company for defense upon direct contact with the enemy; reply to an article published in number three. Voen. vest. 38 no.9:29-30 S '58. (MIRA 11:9)
(Attack and defense (Military science))
(Infantry drill and tactics)

GINZBURG, Z.M., inzh.; BRAVIN, L.S., inzh.; FREYDIN, V.I., inzh.

Automatic control of a dredge slag removal pumping unit. Elek. sta. 32 no. 5:79-80 My '61. (MIRA 14:5)
(Electric power plants) (Automatic control)

BRAVIN, L.S., inzh.; CHACHKO, A.G., inzh.

New system for the control of boiler-turbogenerator units.
Teploenergetika 8 no.9:28-33 S '61. (MIRA 14:8)

1. Kiyevskoye otdeleniye Vsesoyuznogo gosudarstvennogo proyektnogo instituta "Teploelektroproyekt".
(Power stations) (Automatic control)

BRAVIN, L.S., inzh.; CHACHKO, A.G., inzh.

Selective control system in a 200 Mw. block. Elek. sta. 36 no.10:15-19 O '65. (MTRA 18:10)

ACC NR: AP7009564 SOURCE CODE: UR/0104/67/000/001/0043/0047

AUTHOR: Bravin, L. S. (Engineer)

ORG: none

TITLE: Control of three hundred megawatt power unit

SOURCE: Elektricheskiye stantsii, no. 1, 1967, 43-47

TOPIC TAGS: thermoelectric power plant, control system reliability

SUB CODE: 10,14

ABSTRACT: The Kiev Division of the Institute of Thermal Electric Power Planning, in cooperation with Steam Generator and Turbine Plants, has developed control principles to be applied to the control of three hundred megawatt power units. These principles are as follows: the particular important parameters are controlled individually by separate instruments; the function of massive technological control is performed by a computer, the IV-500; remote control from the control panel is performed generally using selector circuits; only the most responsible individual objects are subjected to individual control; memo-circuits are used for better orientation of the operator; automatic control is performed using contactless regulators and contactless actuators. The usage of this information machine and selective remote control principle has allowed: automatic checking of

Card 1/2 UDC: 621.311.176

ACC NR: AP7009564

parameters in the power unit and calculation of technical and economic indicators; creation of a compact, unified control panel; an essential increase in the operational characteristics and reliability of the control system as a whole. Orig. art. has: 3 figures and 2 tables. [JPRS: 40,102]

TRAKHTMAN, I.M.; IOFFE, A.B.; CHERNYY, M.I.; KUZNETSOV, S.N.; SOLOV'YEV, N. P.; DOROGUSH, G.I.; KAPUSTIN, L.D.; VINBERG, B.G.; RUBCHINSKIY, Z. M.; PETRO, G.A.; ZAGORDAN, N.M.; BRAVIN, V.F.

Multiple-unit rail car with regenerative braking. Prom. energ. 15 no.11:18-19 N '60. (MIRA 14:9)
(Railroad motorcars) (Electric railway motors)

BRAVINA, V.Ye.

BRAVINA, V.Ye.: "The surface tension of strong electrolytes". Moscow, 1955. Moscow State Pedagogical Inst imeni V.I. Benin. (Dissertations for the Degree of Candidate of Physicomathematical Sciences).

SO: Knizhnaya letopis' No 45, 5 November 1955. Moscow.

BRAVINA, V. YE.

AUTHOR: Bravina , V.Ye. 56-4-47/54

TITLE: Boundary Laws for the Surface Tensions in Solutions of Strong Electrolytes (Predel'nyye zakony dlya poverkhnostnogo natyazheniya rastorov sil'nykh elektrolitov) (Letter to the Editor)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 4, pp. 1065 - 1067 (USSR)

ABSTRACT: Two problems are theoretically solved:

1.) Electrolytes of the unsymmetrical type with many valences. In contrast to the one - single valent electrolyte the electric neutrality of every volume element is disturbed in the surface layers of this type of electrolyte. This leads to the fact that beside the potential which is due to the electrostatic properties of the ions (the screening action of the ions of the environment is taken into account) an additional field must also be taken into account which is caused by the electrostatic dissymmetry. The corresponding mathematical expressions are derived for this potential, for the ion distribution and the density of charge.

Card 1/2

Boundary Laws for the Surface Tensions in Solutions of Strong Electrolytes 56-4-47/54

2.) The taking into account of the dielectric constant of an external medium. For the one - single valent electrolytes equations are also derived for the potential and for the variation of the surface tension.

SUBMITTED: July 18, 1957

AVAILABLE: Library of Congress

Card 2/2

5(4)

AUTHOR: Bravina, V.Ye. SOV/55-58-2-11/35

TITLE: Some Questions of the Theory of Surface Tension of Solutions of Strong Electrolytes (Nekotoryye voprosy teorii poverkhnostnogo natyazheniya rastvorov sil'nykh elektrolitov)

PERIODICAL: Vestnik Moskovskogo Universitets. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 2, pp 85-92 (USSR)

ABSTRACT: The author investigates the surface tension of solutions of strong multivalent electrolytes of unsymmetric type for sufficiently small concentration ($\varkappa q << 1$, where $1/\varkappa$ is the radius of Debye - Hückel and $q \sim e^2/\varepsilon kT$ means the distance in which the energy of the electrostatic interaction can be compared with the mean kinetic energy of the ions). Then the surface tension is calculated for increase of the concentration. In the special case of a one-one valent electrolyte the author obtains the formula of Onsager - Samaras [Ref 6]. Furthermore the surface tension for one-one valent electrolytes is calculated, if the dielectric constant of the exterior medium has the same order as the dielectric constant of the solution. In the limit case there occurs again

Card 1/2

coincidence with [Ref 6].
There are 7 non-Soviet references, 6 of which are Soviet, and 1 American.

ASSOCIATION: Kafedra obshchey fiziki dlya khimicheskogo fokul'teta (Chair of General Physics of the Faculty of Chemistry) [Moscow Univ.

SUBMITTED: May 24, 1957.

AUTHOR: Bravina, V. Ye. SOV/2o-12o-4-35/67

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ABSTRACT: L.Onsager (Onzager) and N.T.Samaras (Semaras)(Ref 1) simplified the differential equations by Wagner(Vagner) and investigated the solutions of strong univalent electrolytes on the assumption that the dielectric constant ε' of the outside medium is much lower than the dielectric constant ε of the medium. In the present paper the result obtained by Onsager-Samaras is developed in two directions: Firstly, solutions of multivalent electrolytes of the unsymmetrical type are investigated for the case $\varepsilon' \gg \varepsilon$ and secondly, ε' is taken into account in the solutions of univalent electrolytes. An expression for the potential energy of the ions of the i-th kind is written down for multivalent electrolytes. If attention is confined to solutions of sufficiently low concentration, the surface layer can be subdivided into two domains; the above mentioned formula can then

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be simplified for each of these domains. The solutions of the differential equations corresponding to these domains can be smoothly joined together; they determine the potential φ from 0 to $-\infty$. Unlike what is the case with univalent electrolytes, the charge density is not equal to zero, but the surface layer as a whole is electrically neutral. An expression for the dependence of surface tension on adsorption is then written down. The final expression resulting for the adsorption potential is written down; it cannot be expressed by elementary functions. The author thanks V.G.Levin for having raised the problem and Professor Ye.M.Lifshits for some valuable advice. There are 2 figures and 6 references, 1 of which is Soviet.

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On the Theory of the Surface Tension of Strong Electrolyte Solutions SOV/2o-12o-4-35/67

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1. Electrolytes--Surface tension 2. Electrolytes--Dielectric properties 3. Mathematics--Applications

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BRAVINSKIY, V.G.; BRAVINSKAYA, Ye.G.

Rapid method of controlling the thermal expansion of materials. Zav.lab. no.11:1336-1338 '59. (MIRA 13:4)
(Materials--Testing) (Heat (Expansion))

BRAVINSKIY, E., inzh.

Large-slab housing construction by the Coignet system in France.
Zhil. stroi. no. 3:29-31 Mr '61. (MIRA 14:4)
(France—Precast concrete construction)

SHISHKIN, A.A., doktor tekhn.nauk, prof.; BRAVINSKIY, E.A., mladshiy nauchnyy sotrudnik

Sealing joints of panel-type buildings in wintertime with concrete and an addition of sodium nitrite. Bet.i zhel.-bet. 9 no.12:537-540 D '63. (MIRA 17:2)

SHISHKIN, A.A., doktor tekhn. nauk; BRAVINSKIY, E.A., inzh.

Causes of early crack formation during the "dry" placement of floors on wall panels. Anal. prich. avar. i povr. stroi. kon. no.2:102-120 '64. (MIRA 18:5)

SHISHKIN, A.A., doktor tekhn. nauk; SMIRNOV, V.D., kand. tekhn. nauk;
BRAVINSKIY, E.A., kand. tekhn. nauk

Winter sealing of precast structures without heating. Prom. stroi.
43 no.10:7-10 '65. (MIRA 18:11)

BRAVINSKIY, G., inzhener.

In complex hydrogeological conditions. Mast.ugl.5 no.9:13-14 S '56.
(Donets Basin--Shaft sinking) (MLRA 9:10)

PUCHNOV, A.F., Geroy Sotsialisticheskogo Truda; BRAVINSKIY, G.A., gornyy inzh.

Using the UKB-3.6 boring machine unit for mining the upper part of shafts in unstable formations and quicksand. Ugol' Ukr. 4 no.9:33-34 S '60. (MIRA 13:10)

(Boring machinery)
(Shaft sinking)

BRAVINSKIY, G.A., gornyy inzhener

Use of the UKB-3,6 r unit for shaft boring in Mine No.4/21 of the Stalinugol' Trust. Ugol' Ukr. no.6:24-25 Je '61. (MIRA 14:7)

(Donets Basin—Shaft sinking)
(Rock drills)

BRAVINSKIY, G.L., inzh.

Construction of a sulfuric-acid plant using graphic work schedules. Prom. stroi. 43 no.9:32-34 '65. (MIRA 18:9)